

Environmental Protection Agency
Mine Waste Technology Program
Physical Solutions for Acid Mine Drainage
at Remote Mine Sites Project

Project Management

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Project Waters

- Susie/Valley Forge Adit (Susie)
 - Lee Mountain Mine
 - Red Water Mine
 - Rimini Combined Waters
 - ASARCO Well EH-100
 - ASARCO Stormwater
 - ASARCO Combined Waters
- Susie Mine water was selected as the project water

Project Objectives

- Design, construct, test, and evaluate a treatment process to remove arsenic and heavy metals from the Susie adit discharge

Treatment System Goals

- Meet the Montana Circular WQB-7 Standards for Tenmile Creek Drainage
- Utilize the Physical Characteristics of the Susie Mine to support the selected treatment system operation and economics

Susie Water Contaminants, Standards

Susie/Valley Forge Mine Site

Bench-Scale Tests

- Tests Performed

- Filtration (0.45 microns and 0.2 microns)
- pH adjustments using CaO and NaOH
- Oxidation using H₂O₂ and NaHClO
- Ferrous and ferric tests
- Phosphate tests
- GFH adsorptions tests
- pH adjustment, precipitation, sand filtration, GFH

Technology

Reductive Precipitation Process

Two-Stage Iron Precipitation/Filtration Process

- pH adjustment using hydrated lime combined with adsorption of As and metals onto ferrous and ferric precipitates;
- Natural settling of the precipitates (sludge);
- Modification of sludge to pass the Toxicity Characteristic Leach Procedure (TCLP);
- Polishing (if necessary) using Granular Ferric Hydroxide; and
- Disposal of treated sludge to Luttrell Repository

Susie Mine Room Dimensions

Susie Mine Adit Before Construction

Susie Mine Adit After Construction

Installing Concrete Floor

White-Washed Ceiling and Walls

Treatment System In Susie Mine

Operation of Treatment System

ROM Costs for

Treatment Systems

Estimate Annual Operating Costs

Physical Solutions Project

- Future Plans
 - Operate the System
 - Perform a Cost Comparison to the Passive Treatment System at the Lee Mountain Mine in Rimini, MT